

ACCESSION NR: AP4039272

S/0148/64/000/005/0040/0045

AUTHOR: Vvedenskiy, V. S.; Rubenchik, Yu. I.; Semenchenko, G. V.; Kryakovskiy, Yu. V.; Yavovskiy, V. I.

TITLE: Improvement of deoxidation methods during the finishing of "10Kh16N2M6" and "40KhNMA" steel

SOURCE: IVUZ. Chernaya metallurgiya, no. 5, 1964, 40-45

TOPIC TAGS: rare earth metal, stainless steel, structural steel, austenitic carbide steel, low plasticity, hot working, calcium silicon additive, deformation, nonmetallic inclusion, ferrocium, grain coarsening

ABSTRACT: The authors investigated the effect of rare earth metals on the quality of stainless and structural steel. Austenitic carbide steel "10Kh16N2M6" served as a specimen. The low plasticity of this steel after hot working was studied in cast and forged pieces. Calcium silicon powder and lumps were added to the melt. Deformed and non-deformed specimens ruptured after forging and 180 C bending. Chromite inclusions were identified in all specimens. In cast and rolled specimens 0.2% ferrocium enhanced plasticity while mechanical properties

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remained unchanged. The carbide phase was more uniformly distributed. In "40KhNMA" structural steel 1 kg/t ferrocerium and calcium silicon added during the finishing period to an 18 ton electric furnace prevented hairline cracking. The authors assume that deoxidation during the finishing stage changes the physical properties of non-metallic inclusions. A coarsening of the natural grain of up to 4 ASTM is indicative of a higher purity along grain boundaries. Orig. art. has: 5 figures and 3 tables.

ASSOCIATION: Moskovskiy institut stali i splavov i Izhevskiy metallurgicheskiy zavod (Moscow Institute of Steel and Alloys and Izhevsk Metallurgical Plant)

SUBMITTED: 30Dec63

ENCL: 00

SUB CODE: MM

NO REF SOV: 002

OTHER: 000

Card 2/2

RUBENCHIK, Yu.I.; KRYAKOVSKIY, Yu.V.; YAVOYSKIY, V.I.; KULIKOVA, M.N.

Nature of nonmetallic inclusions of rare-earth elements in iron  
and steel. Zav. lab. 30 no.1:57-58 '64. (MLA 17:9)

1. Moskovskiy institut stali i splavov.

PERMYAKOV, L.N. (Moskva); KRYAKOVSKIY, Yu.V. (Moskva); VISHKAREV, A.F.  
(Moskva); YAVOYTSKIY, V.I. (Moskva)

Effect of rare-earth metals on the behavior of nitrogen  
in liquid iron and steel. Izv. AN SSSR. Met. 1 gor. delo  
no.4:68-75 J1-Ag '64. (MIRA 17:9)

NIKOLAYEV, Ye.I.; KRYAKOVSKIY, Yu.V.; TYURIN, Ye.I.; YAVOYSKIY, V.I.

Chemical heterogeneity and nonmetallic inclusions in ingots of steel  
with rare-earth metals. Izv. vys. ucheb. zav.; chern. met. 8 no.7:37-  
42 '65. (MIRA 18:7)

1. Moskovskiy institut stali splavov.

BELYAKOVA, A.F.; PAISOV, I.V.; KRIKOVSKIY, Y. V.; TATARINTSEV, V. Ia.

Grain boundaries in structural steel with and without additions  
of rare earth metals. Izv. vyz. ucheb. zav., Chern. met. 8  
no.9:163-167 1965. (MIRA 18:9)

1. Moskovskiy institut stal i spivov.

L 9635-66 ENT(m)/ENT(w)/EWA(d)/T/ENT(t)/ENT(s)/ENT(b)/EWA(c) MJW/JD

ACC NR: AP5027713

SOURCE CODE: UR/0129/65/000/011/0041/0042

AUTHOR: Belyakova, A. F.; Paisov, I. V.; Kryakovskiy, Yu. V.; Tatarintsev, V. Ya.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Causes of the high impact strength of steels containing rare-earth metals

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 11, 1965, 41-42, and bottom half of insert facing p. 41

TOPIC TAGS: rare earth metal, steel, metal grain boundary contamination, electron microscopy, nonmetallic inclusion / EM-5 electron microscope

ABSTRACT: As recently established (A. F. Bolyakova et al. MITOM, 1959, no.9), the addition of rare-earth elements (REM) such as ferrocenium<sup>1</sup> to 40KhNMA steel results in the substitution of the plastic sulfides of Fe and Mn with relatively nonplastic spheroidal REM inclusions, i.e. with sulfides<sup>2</sup> and oxysulfides of Ce. It is believed that REM decontaminate grain boundaries and that this is one of the reasons for their favorable effect on the properties of steel. To verify this, the authors performed an electronmicroscopic examination of the structure and properties of 40KhNMA steel alloyed with small amounts of REM. Following impact tests of the specimens, which revealed an increase of as much as 6.6 kg-m/cm<sup>2</sup> in impact strength, sections of the specimens were etched to reveal the grain boundaries and processed into replicas

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UDC: 620.178.167:620.187.2:699.85/26

L 9635-66

ACC NR: AP5027713

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which then were examined with the aid of an EM-5 electron microscope (magnification 10,000 times). The findings were processed by selecting the boundaries separating ferrite grain, since the boundaries between ferrite and pearlite grains represented continuous chains of carbides oriented along the boundaries, and calculating the number of each of the following types of examined boundaries: completely pure boundaries and the boundaries containing 2-3, 4-7, 8-12, and >12 inclusions (nonmetallic inclusions, intermetallics, carbides) over a 15  $\mu$  long boundary section, and then determining their percentile ratio to the total number of the ferrite boundaries examined. On this basis it was established that the grain boundaries in steel containing REM are actually more contaminated than in REM-free steel. Hence, REM in reality do not decontaminate the grain boundaries. It was also found, however, that in REM-containing steel most segregations at grain boundaries are spheroidal, as opposed to their rectangle and square shapes in REM-free steel. The spheroidal segregations presumably represent the oxides and oxysulfides of REM and apparently are one of the reasons for the higher impact strength of REM-containing steel. The nature of these segregations should be a subject of further investigations. Orig. art. has: 3 figures.

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 005/ OTH REF: 000

Card

2/2



BELIAKOVA, A.F.; KRYAKOVSKIY, Yu.V.; PAISOV, I.V.

Effect of rare-earth metals on the structure and properties of  
structural steel. Metaloved. i term.obr.met. no.9:37-41 S '65.  
(MIRA 18:10)

1. Moskovskiy institut stali i splavov.

BELYAKOVA, A.F.; PAISOV, I.V.; KRYKOVSKIY, YU.V.; YEREMENKO, V.Ye.

Causes of a high impact toughness in steel containing rare-  
earth metals. Metalloved. i term. obr. met. no.11.21-42 N '65.  
(MIRA 18:12)

1. Moskovskiy institut stali i splavov.

L 21021-66 EWT(m)/EWA(d)/EWP(t) IJP(c) MJW/JD/JG

ACCESSION NR: AP5022580

UR/0129/65/000/009/0037/0041  
669.85/6:620.18:669.14.018

20  
17  
B

AUTHOR: Belyakova, A. F.; Kryakovskiy, Yu. V.; Paisov, I. V.

TITLE: Effect of rare-earth metals on the structure and properties of machine steel

SOURCE: Metallovedeniya i termicheskaya obrabotka metallov, no. 9, 1965, 37-41, and insert facing p. 25 and top half of insert facing p. 40

TOPIC TAGS: rare earth metal, machine steel, toughness, nonmetallic inclusion, grain structure, metal hardening

ABSTRACT: The structure and properties of the machine steels 40KhNMA and 21 34KhN1MAR were investigated as a function of the addition of ferrocerium (0.6 and 2 kg/ton, respectively) to the ladle. Electronmicroscopic, fractographic, mechanical, and other tests of specimens cut out of the ingots revealed that in steels with r.e.m. (rare-earth elements) grain-boundary/tension is lower than in steels without r.e.m., and the boundaries are better-defined and less contaminated by impurities, since r.e.m. have a marked affinity with impurities and interact with

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ACCESSION NR: AP5022580

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them to form stable chemical compounds within the grain body, thus preventing the impurities from segregating out at the boundaries. Furthermore, the addition of r.e.m. to 40KhNMA steel enhances its impact toughness owing to the effect of r.e.m. on the form of nonmetallic impurities -- the transformation of threadlike (linear) sulfides into spheroidal inclusions with r.e.m. and the reduction in the proportion of large linear inclusions. In addition, r.e.m. delay the growth of austenite grains by causing the number of inclusions to increase while at the same time causing the size of the average inclusion to decrease. For the same reasons, r.e.m. reduce the hardenability of steel. Investigations of the effect of r.e.m. on hardness, electric resistance, amount of residual austenite, and impact toughness revealed that aside from the impact toughness of hardened steel at low and medium tempering temperatures, r.e.m. do not appreciably change these characteristics. Orig. art. has: 5 figures, 3 tables.

ASSOCIATION: Moskovskiy institut stali i splavov (Moscow Institute of Steel and Alloys)

SUBMITTED: '00

ENCL: 00

SUB CODE: MM, SS

NO REF SOV: 003

OTHER: 000

Card 2/2 BK

L 40206-66 ENT(m)/Ent(w)/I/ENT(t)/ETI IJF(c) JD/XJ

ACC NR: AP6030051

SOURCE CODE: UR/0133/66/000/001/0072/0073

AUTHOR: Kul'kova, M. N.; Ponomareva, Ye. P.; Rubenchik, Yu. I.; Kryakovskiy, Yu. V.; Yavoykiy, V. I.

ORG: 'Krasnyy Oktyabr' Plant (Zavod "Krasnyy Oktyabr"); Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Effect of rare earth metals on the properties of 12Kh1MF steel

SOURCE: Stal', no. 1, 1966, 72-73

TOPIC TAGS: steel, rare earth metal, steel macrostructure, mechanical property/  
12Kh1MF steel

ABSTRACT: The authors studied the nature and distribution of inclusions in 12Kh1MF tube steel with and without additions of rare earth metals. Three methods were used for adding the rare earth metals to the melt: 1) in the furnace immediately before tapping (2-3 kg/t); 2) in the pouring ladle (0.2-1.0 kg/t); and 3) in the mold during teeming (0.2-0.7 kg/t). Macrostructural analysis revealed that addition of rare earth elements by any method and in any quantity reduces local segregation of sulfur, although the degree of improvement is highly dependent on the method used for introducing the rare earth metals. For instance, additions of 3 kg/t to the furnace gives about the same effect as addition of 0.7-0.8 kg/t to the ladle. Additions of less than 3 kg/t to the furnace or less than 0.2-0.5 kg/t to the ladle have practically no effect on macrostructure. Direct introduction of rare earth metals during teeming has a more noticeable

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UDC: 559.18:658.562

L 40206-66

ACC NR: AP6030051

effect. The distribution of sulfur is changed considerably even by additions of 0.5-0.6 kg/t. The mechanical properties of longitudinal specimens were not changed by rare earth treatment regardless of method of introduction or quantity of additive introduced, while treated transverse specimens showed a considerable improvement in mechanical properties. Orig. art. has: 2 figures and 1 table.  
[JPRS: 35,681] 16

SUB CODE: 11, 20 / SUBM DATE: none / ORIG REF: 002

Card 2/2

GLUSHCHENKO, P.M., inzh.; KRYAKOVITSEY, G.F., master-vzryvnik (g. Kadiyevka, Donbass); BELINSKIY, I.; RUDENKO, I., rayonnyy gornotekhnicheskii inspektor; OL'KHOVSKIY, A.

Readers' letters. Bezop truda v prom. 7 no. 4:37. Ap '63.  
(MIRA 16:4)

1. Biyskiy kotel'nyy zavod (for Glushchenko). 2. Glavnyy inzh. shakhty im. Lutugina (for Belinskiy). 3. Obshchestvennyy inspektor okhrany truda, shakhta 18 bis, tresta Yemanshelimugol' (for Ol'khovskiy).

(Industrial safety)

KRYAKUNOV, N.A.

Single weight and multiple weight surveys in the orientation of deep  
mines. Gor.shur. no.3:45-50 Mr '55. (MIRA 8:7)

(Mine surveying)



Translation from: Referativnyy zhurnal, Geologiya, 1957, Nr 7,  
pp 246-247 (USSR) 15-57-7-10315

AUTHOR: Kryakunov, N. A.

TITLE: Orientation in Mine Surveying (Analiz materialov  
proizvodstvennykh oriyentirovok)

PERIODICAL: Sb. nauch. tr. Kazakhsk. gorno-metallaurg. in-t,  
1956, Nr 14, pp 347-360

ABSTRACT: Data of 211 bearing determinations in mine surveying  
were analyzed. Of these, 115 were of two-wire type,  
49 were successive, and 47 were individual determin-  
ations. Data are given on the distribution of bearing  
determination along the depth of the mine, on the size  
of plumb bob, on the diameter of the wire and on the  
elements of triangulation. The material assembled was  
used to show the effect of a number of factors on the  
results of bearing determination and to determine the

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15-57-7-10315

Orientation in Mine Surveying (Cont.)

accuracy of connecting surveys carried through one or two vertical shafts. The following conclusions were drawn: 1) The error of bearing determination in a mine through one shaft with two-wire system is equal to  $\pm 1$  min 38 sec. No marked increase in error with depth of shaft was revealed. Increase in the rate of air movement in the shaft does not cause a marked increase in error of determinations. Two-wire system of bearing determination did not indicate the presence of a helical movement of air in the mine shafts. 2) The error in bearing determination with the use of two shafts, evaluated from the difference between two repeated determinations proved to be  $\pm 1$  min 49 sec. The reason for the lack of advantage in bearing determination with the use of two shafts is that it is ordinarily impossible to establish closed polygons of suitable form in underground operations.

Card 2/2

V. F. Kvasnikov

KRYAKUNOV, N.A., kandidat tekhnicheskikh nauk.

~~XXXXXXXXXXXXXXXXXXXX~~  
Plumb line behavior in mines. [Trudy] VNIMI no.30:154-194 '56.  
(MLRA 9:11)

(Mine surveying) (Plumb-line deflections)

KUZNETSOV, I.A.; KRYAKUNOV, N.A., dotsent

Determining the closure error for plumb bobs by an experimental  
method. Sbor. nauch. trud. Kaz GMI no.19:71-78 '60. (MIRA 15:3)  
(Triangulation)

OMAROV, T.; KRYAKUNOV, N.A., dotsent

Using a support for automatic centering of a theodolite in an  
arbitrary center of a wall mark. Sbor. nauch. trud. Kaz GMI no.19:  
82-85 '60. (MIRA 15:3)

(Mine surveying)

SERCL, Miroslav; JECHOVA, Dagmar; KOMRSKA, Milan; KOVARIK, Jaromir;  
KRYAL, Vlastimil; LICHÁ, Helena; LICHÝ, Josef; NETTL, Sasa;  
SIMKOVA, Dagmar; STOVÍČEK, Jaroslav; VRCHA, Lubomir; ZDRAHAL,  
Leopold; TUSL, Miloslav; SVORCOVA, Stepanka; KAUT, Vlastislav

On the effect of 1-centimeter electromagnetic waves on the nervous  
system in man (radar). Sborn. ved. prac. lek. fak. Karlov. univ.  
(Hrad Kral) 4 no.4:427-440 '61.

1. Neurologická klinika; přednosta prof. DrSc. MUDr. M. Sercl  
Katedra obecné hygieny; přednosta prof. MUDr. V. Dvorak.  
(RADAR) (NERVOUS SYSTEM physiol)

CH'ALINA, S.N.

On the article by V.I. Kudryavtseva "On the uninterrupted selection of microorganisms from the production."

Mikrobiologiya. Vol. 21. P. 92. 1972.

✓ Fermentation activity of dry yeast cultures. R. N.  
Kul'yabov. *Trudy Vostochn. Nauch. Issledovatel. Inst.*  
Sovetskoi. *Mikrobiol.* 12, No. 2, Pp. 98 (1954); *Russk.*  
Zhur., *Khim.* 1955, No. 3079. Dry wine yeast prepd. by  
the S. A. Korolev method with starch and had retained  
their fermentation capacity over a long period of time and  
were found suitable over a period of 1 year for inoculation  
in fermenting fruit and berry juices. M. Huch



KRYANKV, Yu.V., aspirant.

Valuable initiative. Nauka i shisn' 25 no.2:58 V '58. (MIRA 11:3)

1. Institut filosofii AN SSSR.  
(Atheism)

KRYANEV, Yu.V.

Useless attempts. Nauka i shisn' 25 no.7:52-55 J1 '58.  
(Religion) (MIRA 11:9)

ERVASHIN, I. R.

Technology

Comparative properties of steels for die casting, smelted by the basic and acid processes, Moskva, Mashgiz, 1951

Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

KRYANIN, I. R.

PA 195T56

USSR/Metals - Steel, Casting

May 51

"Concerning Selection of the Electric-Furnace Process in Melting Steel for Shaped Castings," I. R. Kryanin, G. V. Gusko, Engineers, Tsernash (Gen Sci Res Inst of Technol and Mach Bldg)

"Liter Prosvod" No 5, pp 2-6

Analyzed data of 270 production heats and conducted 30 exptl melts in comparative investigation of basic and acid processes of melting carbon steel for shaped castings. Graphs and table show results. High fluidity of acid steel

195T56

USSR/Metals - Steel, Casting (Contd)

May 51

permits production of thin-walled castings of intricate shape. General conclusion is that steel, made by acid process in elec-arc furnace, has considerable advantages over steel melted by basic process.

195T56

KRYANIN, I. P.

USSR/Metallurgy - Welding, Appli-  
cation, Turbines

Sep 52

"Faced Blades of Hydraulic Turbines," I. R.  
Kryanin, Cand Tech Sci, K. A. Dlotov, L. M.  
Yarovitskiy, Engineers, Stalin Prize Laureates,  
V. A. Lapidus, Cand Tech Sci

"Avtozen Delo" No 9, pp 17-21

Discusses technology of facing runner blades  
made of carbon or low-alloy steel with sheets  
of austenitic Cr-Ni-Ti steel. Facing sheets  
are fastened to blades with elec rivets and

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by welding along their perimeter with simulta-  
neous welding to blade body. Technology was  
developed in connection with sharp increase  
in demands for runner blades of hydraulic tur-  
bines and necessity of finding more economical  
method for their fabrication, instead of pres-  
ently used casting out of stainless steel.  
Cost was reduced by 41%.

232179

KRYANIN, I.R.; LYASS, A.M.; YAKOVLEV, V.O.; DUBROVSKIY, A.M.

Casting blades of hydroturbines of the Tsimlyansk and Gor'kiy hydroelectric  
power stations. Lit.proizv. no.6:2-7 Je '53.  
(MLBA 6:7)  
(Blades)

KRYANIN, I.R., kandidat tekhnicheskikh nauk; GORODHANKIN, A.M., inzhener.

Apparatus for the thermal treatment of thin elongated products. Makh.trud.  
rab. 7 no.9:46-47 S '53. (MLRA 6:9)  
(Metals--Heat treatment)

KRYANIN, I.R., kandidat tekhnicheskikh nauk; BABUSHKINA, G.I., inzhener.

Testing the material of hydroturbine blades. Vest.mash. 33 no.11:41-49  
N '53. (MLRA 6:12)  
(Blades)



KRYANIN, I. R.

USSR/Miscellaneous-Metallurgy

Card 1/1

Authors : Kryanin, I. R., and Babushkina, G. I.

Title : Low-alloy steel for faced hydroturbine blades

Periodical : Lit. Proizv. 1, 2 - 5, Jan-Feb 1954

Abstract : Casting blades for large hydro-turbines must have high mechanical and anti-corrosion properties and good resistance to cavitation wear. The low alloy steel 20 GS-L (silico-manganese steel containing 0.16 - 0.22 carbon, 0.6 - 0.8 silicon and 1.0 - 1.3% manganese), because of its satisfactory technical and mechanical properties, is most recommended for the manufacture of hydroturbine blades. Laboratory and industrial tests confirmed the suitability of the 20 GS-L steel for the above intended purpose. Four references. Tables, graphs, drawings.

Institution: :...

Submitted : ....

KRYNNIN, I.R.

Burning-preventing molding mixtures for stainless steel  
castings. U.S. Patent 2,411,111

is a mixt. composed of 100 parts of ground chromite-magnesia brick, 6 parts of Na silicate (sp. gr. 1.45), 1.5 parts of 10% NaOH soln., and 1 part water, backing it with a 40-45-mm. layer of 85-15 mixt. of sand and clay, and filling the mold with sand following usual practice. Grading the brick coarser than 30 mesh reduces the danger of burning, while excessive fineness increases the

KRYANIN, I.R., laureat Stalinskoy premii, kandidat tekhnicheskikh nauk;  
~~SAFRAZBEKIAN, O.S.~~ LAPIDUS, V.A., kandidat tekhnicheskikh nauk; SAFRAZBEKIAN, O.S.,  
inzhener, laureat Stalinskoy premii.

Lining the runners of hydroturbines and preliminary results of  
their operation. Vest.mash.34 no.1:48-51 Ja '54. (MLRA 7:2)  
(Water wheels)

KRYANIN, I. R., BABUSHKINA, G. I.,

"Low Alloy Steel for Large Castings." From the book, "Heat Treatment and Properties of Cast Steel." edited by N. S. Kreshchanovskiy, Mashgiz, Moscow 1955.

KRYANIN, I. R. and BABUSHKINA, G. I.

"Heat-Treating Castings of Chromium Stainless Steel." From the book, "Heat Treatment and Properties of Cast Steel." edited by N. S. Kreshchenovskiy, Mashgiz, Moscow 1955.

KRYANIN, I. R.

KRYANIN, I. R.: "Principles for the selection and development of materials for the blades of high-power hydroturbines". Moscow, 1955. Acad Sci USSR, Inst of Metallurgy imeni A. A. Baykov. (Dissertation for the Degree of Doctor of Technical Sciences)

SO: Knizhnaya Letopis', No. 40, 1 Oct 55

**"APPROVED FOR RELEASE: 06/14/2000**

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KRYANNIN, I.K.  
KRYANIN, I.R.: DUBROVSKIY, A.M.

New casting method for turbine blades to be used at the Kuibyshev  
Water Power Plant. Lit.proizv. no.1:5-8 Ja '55. (MIRA 8:3)  
(Blades) (Steel casting)

✓ 1204 Low Alloy Steel 161X25-1a for Detailed Testing of  
 Components in Hydraulic Installations. Nizkolegironnaya  
 146 steel 161X25-1a dlya tsnovnykh otlobov gidroagregator. (Kras-  
 slan.) I. R. Krut'ko and G. I. Balmukhina. Metallovedenie i  
 obrabotka metallov, 1983, no. 2, Aug., p. 28-32.  
 Relation of crystal lattice parameter of quenched Cu-Mn-Si  
 steel to Cu content, and relation between cavitation resistance  
 and C content. Tests of other properties, including strength,  
 plasticity, and resistance to corrosion show this group of steels  
 may substitute for certain cast high-Cr steels in turbine parts.  
 Graphs, table, photographs.

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KRYANIN, I.R., kandidat tekhnicheskikh nauk

High-strength cast steel of good welding quality. Svar. proizv. no.7:  
7-9 JI '55. (MIRA 8:9)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i  
mashinostroyeniya. (Steel--Welding)

KRYANIN, I.R., kandidat tekhnicheskikh nauk; TIMERBULATOV, M.G., kandidat tekhnicheskikh nauk; BABUSHKINA, G.I., inzhener.

Investigating the cavitation resistance of steels used for hydro-turbine blades. [Trudy] TSNIITMASH no.77:147-158 '55.(MLRA 9:7)  
(Blades--Testing) (Cavitation)

**"APPROVED FOR RELEASE: 06/14/2000**

**CIA-RDP86-00513R000826820007-8**

**APPROVED FOR RELEASE: 06/14/2000**

**CIA-RDP86-00513R000826820007-8"**

IVANOV, V.G., kandidat tekhnicheskikh nauk; KRYANIN, I.R., kandidat tekhnicheskikh nauk; LADYSHENSKIY, B.N., kandidat tekhnicheskikh nauk.

Overheating of low Bessemer steel. Lit.proizv. no.4:31-32 Ap '56.  
(Bessemer process) (MLRA 9:7)

KRYANIN, I. R., kandidat tekhnicheskikh nauk; LAPIDUS, V. A., kandidat tekhnicheskikh nauk.

Coating runner chambers in high-power hydraulic turbines.  
Energomashinostroenie no.8:22-24 Ag '56. (MLRA 9:10)

(Hydraulic turbines) (Hard facing)



KRYANIN, I.R.

Cavitation erosion of turbine blades. Metalloved. i obr.  
met. no.12:9-11 D '56.

(MIRA 10:2)

1. Tsentral'nyy nauchno-issledovatel'skiy institut tyazhologo  
mashinostroyeniya.

(Cavitation) (Blades)

KRYAININ, I. R.

PHASE I BOOK EXPLOITATION

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Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i Mashinostroyeniya.

Vyplavka stali dlya fasonnogo lit'ya (Making of Steel for Shaped Castings) Moscow, Mashgiz, 1957. 142 p. (Its: [Trudy] kn. 86) 3,600 copies printed.

Ed.: Kryainin, I. R., Candidate of Tech. Sciences; Tech. Ed.: ~~El'kind~~, V. D., Managing Ed. for literature on heavy machine building (Mashgiz): Golovin, S. Ya.

PURPOSE: This collection of articles is intended for workers in various branches of the machine-building industry. It may also be used by metallurgical research institutions and by students of the technology of steel production.

COVERAGE: The articles in this collection describe the experimental work done by the Tsentral'nyy Nauchno-Issledovatel'skiy Institut Tekhnologii i Mashinostroyeniya (Central Scientific Research Institute of Technology and Machine Building) in developing new melting and casting methods for various

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Making of Steel for Shaped Castings

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carbon and alloy steels to be used in the manufacture of hollow-shaped forgings. Experiments with various furnaces, in particular with the combined Bessemer basic-electric furnace, are described and evaluated in detail. There are 47 references, 37 of which are Soviet, 6 German, 1 French, and 3 English.

TABLE OF

CONTENTS: Foreword

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Iodkovskiy, S. A., Engineer. Making LA-1 Heat-resistant Austenitic Steel for Shaped Castings

5

The preparation of LA-1 steel, used for gas turbine parts operating at 600°C., and its properties are described. Electric furnaces using semi-acid slag are claimed to be most suitable for the production of this kind of steel. There are no references.

Ivanov, V. G., Candidate of Technical Sciences. Behavior of Sulfur and Phosphorus in a Converter Process

21

Card 2/5

Making of Steel for Shaped Castings

322

The author describes experiments dealing with the removal of S and Ph in a side blown Bessemer process. It is said that the amount of S can be reduced by 24.2% and the amount of Ph can be reduced by 24.5%. The temperature of the molten pig iron and the water content of the blown air are claimed to be important factors in this process. There are 5 Soviet references.

Ivanov, V. G., Candidate of Technical Sciences. Study of a Combination Method of Steel Making.

30

Easy removal of Ph and S from converter steel in an electric furnace permits the use of all types of scrap irrespective of Ph and S content. The greater speed and efficiency of the electric furnace makes it suitable for pouring on a conveyor belt. There are 10 references, 8 Soviet and 2 German.

Gorozhankin, A. N., Candidate of Technical Sciences, Bashmakov, A. D., Engineer. Problems of Steel Making in a Uniflow Furnace of Limited Capacity

66

Card 3/5

.. Making of Steel for Shaped Castings

322

The authors stress the need for a furnace of limited capacity in steel foundries. For this purpose an experimental furnace was developed with a capacity of up to 1 ton. This furnace is said to be slow in reaching operational temperatures; there is also a loss of heat due to the small amount of metal in each charge. Ph and Mg impurities also present a problem. This furnace needs further development and de-bugging before it can be employed on industrial scale. There are 6 references, 5 Soviet, 1 English.

Kraskovskiy, S. V., Candidate of Technical Sciences.  
Decarbonization and Dephosphorization of Steel by Means  
of Air- Oxygen Mixtures

84

To speed up the production of steel it is necessary to improve the process of decarbonization and dephosphorization of steel. Oxygen-enriched air with powdered limestone was blown into the bath of an electric furnace. The author claims that this method is quicker, eliminates the use of iron ore, and produces steel of good quality.

Card 4/5

Making of Steel for Shaped Castings

322

The equipment required is said to be simple and expensive. There are no references.

Novitskiy, V. K., Candidate of Technical Sciences.  
Study of Casting Methods and Structure of Hollow  
Steel Castings

107

The author states that the quality of hollow castings is often unsatisfactory. Slow crystallization is said to present many problems. The experiments deal with the various cores for hollow castings. It was experimentally determined that cores made of thin-walled steel tubes with a cooling arrangement give the best results. There are 16 references, 14 Soviet, 2 English.

AVAILABLE: Library of Congress

Card 5/5

GO/vm  
June 3, 1958

KRYANIN, I. R.

129-11-4/7

AUTHOR: Kryanin, I. R., Candidate of Technical Sciences.

TITLE: Scientific Achievements of TsNIITMASH in the Field of Materials and Engineering Technology. (Nauchnyye dostizheniya TsNIITMASH v oblasti materialov i tekhnologii mashinostroyeniya).

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1957, No. 11, pp. 56-65 (USSR)

ABSTRACT: In the field of developing heat resistant materials TsNIITMASH works in co-operation with all the major industrial undertakings, i.e. The Leningrad Metallurgical Works imeni Stalin (Leningradskiy Metallicheskiy imeni Stalina), the Kharkov Turbine Works imeni Kirov (Khar'kovskiy Turbinny imeni Kirova), the Nevsk Works imeni Lenin (Nevskiy imeni Lenina) etc.; they also co-operate with the Central Boiler-Turbine Institute imeni Polzunov (Institut Tsentral'niy Kotloturbinniy imeni Polzunova), the Central Ferrous Metallurgy Scientific Research Institute (Tsentralniy Nauchno-Issledovatel'skiy Institut Chernoy Metallurgii) etc. On the basis of the obtained results and theoretical assumptions, the Institute has recommended a new heat resistant steel for gas and steam turbines and

Card 1/4 for boilers. For instance, for castings of large rating

129-11-4/7

Scientific Achievements of TsNIITMASH in the Field of Materials and Engineering Technology.

steam turbines operating at 540°C they recommended the use of Cr-Mo-V steel 20ХМФ-Л and the electrodes УЛ-20 for welding this steel and during recent years this steel has been widely applied in the Soviet Union. For operation under relaxation conditions at 550°C TsNIITMASH developed and recommended the pearlitic steel 30Л723 which proved technologically very favourable and cheap. For cast components of turbines operating at 570°C the Cr-Mo-V steel 15Х1М1Ф-Л was developed and introduced. Furthermore, the Cr-Ni-Co steel ЛА-1 was introduced for cast components of steam and stationary gas turbines operating at temperatures up to 650°C. A number of steels have been developed for hydraulic turbines and for casting large blades for hydraulic turbines. TsNIITMASH in co-operation with NKIIZ have developed a new technology and mechanized equipment for moulding the blades and also moulding materials. As a result of these new techniques a tenfold increase in the manufacturing capacity of such blades was achieved. Fig. 2, p. 58, shows a photo of the blade (steel 20ГC-Л)

Card 2/4 of the turbines of the Kuybyshev hydraulic power station.



129-11-4/7

Scientific Achievements of TsNIITMASH in the Field of Materials and Engineering Technology.

This Institute, in co-operation with LMZ , also developed a new technology for manufacturing "one off " components of hydraulic turbines by welding together individual sections produced by casting or forging. A fully forged shaft of a hydraulic turbine, the manufacture of which has to be effected from an ingot weighing 200 tons, can be substituted, by using this new technique, by a shaft forged from a hollow ingot or welded together from two sheets of 200 mm thickness to which cast flanges are welded on by the electric slag method. TsNIITMASH has also developed a number of high strength cast irons which should in future substitute cast steel for various applications. This Institute has developed an original method of micro-electro-chemical investigation of structural corrosion under stress which permits studying the fundamental mechanism of corrosion cracking of metals subjected to mechanical stresses and located inside liquid corrosive media. The test methods and the test facilities available at TsNIITMASH are also dealt with in some detail. Figs.3-5 show various models of equipment for fatigue

Card 3/4 testing of shafts and flat specimens; Fig.6 shows a photo

129-11-4/7  
Scientific Achievements of TsNIITMASH in the Field of Materials  
and Engineering Technology.

of a set-up for testing turbine blades at 700°C. TsNIITMASH is doing a considerable amount of work in studying the stability in operation of new grades of steel directly on turbines of operating hydraulic power stations. It was found that the erosion stability of gas turbine blades can be appreciably increased by means of chemical surface hardening and experiments have also confirmed the possibility of using welded cylinder designs in medium power stationary gas turbines. The last paragraph deals with the work of this Institute in development of engineering technology applicable to the manufacture of a great variety of machinery and equipment, particularly relating to moulding and casting, shaping by applying pressure, automatic welding and heat treatment (using current of 50 c.p.s. and higher frequencies). The work of this Institute relating to increasing the wear resistance and the corrosion stability of equipment is also briefly mentioned. There are 10 figures.

ASSOCIATION: TsNIITMASH.

AVAILABLE: Library of Congress

Card 4/4

KRYANIN, I.R., kand.tekhn.nauk; VASILEVSKIY, P.F., kand.tekhn.nauk.

Development and outlook of the steel casting production for heavy  
machinery industry. Vest.mash 37 no.12:28-32 D '57. (MIRA 10:12)  
(Steel castings)

KRYANIN, IVAN ROMANOVICH

PHASE I BOOK EXCITATION

551

Kryanin, Ivan Romanovich

Lopasti gidroturbin; kavitatsionnyye razrusheniya, izyskaniye i issledovaniye materialov (Hydraulic Turbine Blades; Destruction Due to Cavitation; Investigation and Development of Materials) Moscow, Mashgiz, 1958. 206 p. 2,200 copies printed.

Reviewer: Vedenkin, S.G., Professor; Ed.: Kulikov, F.V., Engineer; Tech. Ed.: El'kind, V.D.; Managing Ed. for general technical literature and literature on transport, highway and power machine building (Mashgiz): Ponomareva, K.A., Engineer.

PURPOSE: This book is intended for engineers and technical personnel working in machine manufacturing plants, hydraulic power plants, and in scientific research institutes dealing with the problems of hydraulic turbine construction. It may also be useful to students of higher technical institutes.

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# Hydraulic Turbine Blades (Cont.)

551

COVERAGE: This book deals with problems in the development and analysis of materials used for manufacturing powerful hydraulic turbine blades. The author states that the intensive growth of Soviet hydraulic turbine building has resulted in a demand for new materials and increased research in this field. The basic characteristics of turbine blade function and the cavitation erosion of materials are discussed in detail. The book contains research data on various types of steels and alloys used for hydraulic turbine blades. There are 124 references of which 102 are Soviet, 10 English, and 12 German.

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Hydraulic Turbine Blades (Cont.)

551

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Hydraulic Turbine Blades (Cont.)

551

2. Hydraulic turbine blades made of type 18DGS-L copper steel 200
3. Bimetallic blades (type 20GS-L steel castings clad with  
type 1Kh18G9T stainless steel sheets) 201

203

. Bibliography

· AVAILABLE: Library of Congress

Card 5/5

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8-25-58



LEVANDO, V. V., (Engr.) KRYANIN, I. R. (Cand. of Tech. Sci.)

"Structure and Properties of the Metal of Large Castings."

in book - Improving the Quality of Steel Castings,; Transaction of the All-Union Conference, Moscow, Mashgiz, 1958. 214 p.

~~XXXXXXXX~~ Abstract: The authors investigate 20GSL low-alloy manganese-silicon steel as a material for casting massive turbine blades. Such a blade was cast and analyzed to determine the degree of chemical homogeneity and also the microstructure, microstructure, mechanical properties, and hardness of various sections of the blade. It was found that this steel is very well suited for the casting of many types of machine parts where high strength and good plastic properties are required, and also for turbine, blades, provided the blade is surfaced with stainless steel to assure cavitation stability.

KRYANIN, Ivan Romanovich -- awarded sci degree of Doc Tech Sci for the  
23 Dec 57 defense of dissertation: "Bases for the selection and investia  
gation  
/of materials for the blades of powerful hydroturbines" at the Council,  
Central Sci-Res Inst of Technology and Machine-Constr; Prot No 14,  
31 May 58.

(BMVO, 11-58,19)

KRYANIN, I.R., doktor tekhn.nauk prof.

Cavitation fracture and testing of material for the blades  
of hydraulic turbines. [Trudy] TSNIITMASH 100:273-292  
'59. (MIRA 13:7)

(Hydraulic turbines--Blades)

BABUSHKINA, G.I., inzh.; KRYANIN, I.R., doktor tekhn.nauk, prof.;  
TIMERBUIATOV, M.G., kand.tekhn.nauk

Resistance of steel to cavitation fracture depending on  
the homogeneity of structure and mechanical features.  
[Trudy] TSNIITMASH 100:293-310 '59. (MIRA 13:7)  
(Hydraulic turbines--Corrosion)

83302

S/114/60/000/010/005/007  
E194/E484

26.4230

26.2120

AUTHORS: Kryanin, I.R., Doctor of Technical Sciences and  
Dabushkina, G.I., Engineer

TITLE: Corrosive and Abrasive Wear of Metals in Water Turbines

PERIODICAL: Energomashinostroyeniye, 1960, No.10, pp.33-35

TEXT: Water turbine parts exposed to the action of water sometimes get very severely worn by solid particles in the water. This is particularly likely to occur if the power stations have no settling ponds as may happen on the mountain rivers of Central Asia and the Caucasus. In some cases, turbine parts have required major overhaul or replacement after one year of use. The most heavily worn parts are usually those which change the direction of the water. In radial-axial turbines, the runner is most subject to damage particularly the lower rim. Fig.1 shows a runner made of steel grade 30G-L after 1 year's operation at the Shaarikhansk Power Station and it will be seen that wear is catastrophic. A runner made by an English firm of stainless steel with 12% chromium experienced similar wear. Fig.2 shows a runner after 2 years' operation; it was heavily worn, further details of the damage are illustrated in Fig.3, 4 and 5. The difference

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E194/E484

### Corrosive and Abrasive Wear of Metals in Water Turbines

between wear by corrosive abrasion and cavitation is illustrated in Fig.6. The main properties of metal that influence its resistance to corrosive abrasion are its micro-structure and hardness. Some design changes should be made in turbine runners for such conditions to reduce the rate of flow. The grades of steel used should have high resistance to abrasion. Some parts should be made of carbon or low alloy steels and surface treated with special electrodes at points of potential damage. Welded runners made of different materials offer advantages. In some cases, it may be advisable to use replaceable facings of the inner surfaces made with high alloy steels. The best method of repair is by welding with special electrodes. Since 1956, TsNIITMASH has been making laboratory tests which show that a most promising grade of steel is austenite-ferrite (chrome-nickel-manganese-copper) steel 1Kh18N3G3D2-L. This metal has been used for runner repairs and after running for 10000 hours was found to have a better resistance to corrosive abrasion than high alloy steels (austenitic 1Kh18N9T and very hard chrome-copper 1Kh13ND-L).

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44

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E194/E484

**Corrosive and Abrasive Wear of Metals in Water Turbines**

To accumulate experience with this grade of steel, the Neva Engineering Works and the Leningrad Metal Works manufactured a cast runner illustrated in Fig.7. This runner has been in operation since 1959. Test results with other grades of steel will be described in a further article. There are 7 figures.

LH

Card 3/3

BABUSHKINA, G.I., inzh.; KRYANIN, I.B., doktor tekhn.nauk, prof.;  
LAPIDUS, V.A., kand.tekhn.nauk

Copper steel for the blades of large hydraulic turbines.  
[Trudy] TSNITMASH 100:311-346 '59. (MIRA 13:7)  
(Copper steel) (Hydraulic turbines—Blades)



## THE 100 BEST

8/25/2023

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Ed. J. A. Lewis, *Coeditor of Technical Sciences*; Ed. of Publishing Board: J. E. Lenz, *Chairman*; Techn. Ed.: V. B. El'ner, *Managing Ed.*; Reviews on Publishing and Environment: Ed. Publishing: F. F. Bel'man; Editorial Board: L. A. Levin, *Coeditor of Technical Sciences*; (Coeditor): V. B. Bel'man, *Coeditor of Technical Sciences*; Coeditor of Technical Sciences: V. B. Bel'man; Coeditor of Technical Sciences: and A. V. Tsvetkov, *Coeditor of Technical Sciences*.

NOTES: This collection of articles is intended for technical personnel concerned with problems of corrosion of metals.

**CONCLUSIONS:** The collection contains thousands of laboratory-verified specimens of stainless steels and various compositions of various steels, low-alloy and stainless steels, and light-weight and nonferrous alloys. The history of each of the various compositions and grades is described under specific conditions as discussed and the nature of treatment and processing required to achieve the properties are outlined. Most of the materials are accompanied by Millwright's references. The majority of titles are in German.

Partick, L. A., *Confidence of Political Beliefs*, and E. A. *Countrymen's*  
*Beliefs*, *Applied Method of Determining the Tendency of Beliefs* 52-53  
 toward Interpretative Correlation

## II. STATE OF CALIFORNIA

[illegible][illegible]

### Section 1.1.1. *Flow, Erosion, Conditions of Technical Systems, and*

IV. **PROSECUTION OF CASES FILED AND FOR FILED**

Abstracts of Contributions of Technical Sciences. Carrollus Cawling of High  
Strength Steels

**Cristofari, M.H.** Corrosion Cracking of Welded Pipelines Made of Carbon Steel in Acidic Brine Solution

**Flory, P.J.: Conditions of Technical Success. The Effect of Program Diffusion on Its Endurance**

A.O. Vysotskiy, E.A. Gerasim and V.I. Kuznetsov, participated in this study prepared at the Moscow Polytechnical Institute (Moscow Steel Institute named K.Y. Galka)

[illegible]

GOROZHANKIN, A.N., kand.tekhn.nauk; NOVITSKIY, V.K., kand.tekhn.nauk;  
 KRYANIN, I.R., doktor tekhn.nauk; IODKOVSKIY, S.A., kand.tekhn.  
 nauk; LADYZHENSKIY, B.N., kand.tekhn.nauk; MIL'MAN, B.S., kand.tekhn.  
 nauk; KLOCHNEV, N.I., kand.tekhn.nauk; TSYPIN, I.O., kand.tekhn.  
 nauk; LEVIN, M.M., kand.tekhn.nauk; BALDOV, A.L., inzh.; LYASS,  
 A.M., kand.tekhn.nauk; CHERNYAK, B.Z., kand.tekhn.nauk; ASTAF'YEV,  
 A.A., kand.tekhn.nauk; YERMAKOV, K.A., inzh.; GRIBOYEDOV, Yu.N.,  
 kand.tekhn.nauk; MYASOYEDOV, A.N., inzh.; BOGATIREV, Yu.M., kand.  
 tekhn.nauk; UNKSOV, Ye.p., doktor.tekhn.nauk, prof.; SHOFMAN, L.A.,  
 kand.tekhn.nauk; PERLIN, P.I., inzh.; MOSHNIN, Ye.N., kand.tekhn.  
 nauk; PROZOROV, L.V., doktor tekhn.nauk; CHERNOVA, Z.I., tekhn.  
 red.

[Some technological problems in the manufacture of heavy machinery]  
 Nekotorye voprosy tekhnologii tiashelogo mashinostroeniya. Moskva,  
 Gos.nauchno-tekhn.isd-vo mashinostroit. lit-ry. Part 1. [Steel smelt-  
 ing and casting; founding; heat treatment; shaping metals by pres-  
 sure] Vyplavka i raslika-stali, litainoe proizvolstvo, termiche-  
 skaya obrabotka, obrabotka metallov davleniem. 1960. 266 p. (Moscow.  
 Tsentral'nyi nauchno-issledovatel'skii institut tekhnologii i mashi-  
 nostroeniya. [Trudy] no. 98). (MIRA 13:7)  
 (Steel) (Founding) (Forging)

KRYANIN, I.R., doktor tekhn.nauk; DUBROVSKIY, A.M., inzh.

Studying and developing new techniques for casting powerful hydraulic turbine blades. [Trudy] TSHIITMASH 97:183-208 '60. (MIRA 13:8)  
(Founding)  
(Hydraulic turbines--Blades)

11/18  
S/135/63/000/001/001/016  
A006/A101

AUTHORS: Pokatayev, S. V., Engineer, Novitskiy, V. K., Candidate of Technical Sciences, Kryanin, I. R., Doctor of Technical Sciences

TITLE: The effect of the steel melting method upon toughness in the weld-adjacent zone during electric slag welding

PERIODICAL: Svarochnoye proizvodstvo, no. 1, 1963, 3 - 8

TEXT: Different values of toughness in weld-adjacent zones of steel from different heats depend on melting factors, such as deoxidation, content of sulfur, phosphorus and gas. The investigation was made with grade 20ГC (20GS) steel containing (in %): 0.16 - 0.22 C, 1.0 - 1.3 Mn, 0.6 - 0.8 Si,  $\leq 0.030$  S and P;  $\leq 0.3$  Cr, Ni and Cu. Specimens of steels from different heats were electric-slag welded at 850 - 900 amps current; 40 - 41 v arc voltage; 203 m/h electrode feed rate, and 1.2 m/h welding speed. The flux was ФЦ-7 (FTs-7). The following results are presented. The melting process exerts a considerable effect upon the mechanical properties of 20GS steel. Free Al in amounts of 0.01% and less, reduces the toughness on account of ferrite brittleness and the

Card 1/3

The effect of the steel melting method upon...

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A006/A101

singling out of sulfides in the form of films on the austenite grain boundaries. Ferrite brittleness is caused by an increased content of dissolved oxygen and nitrogen. Particularly high sulfide separation on the grain boundaries takes place at a sulfur content in the steel exceeding 0.02%. A low content of free Al and increased sulfur amounts reduce the metal toughness in the coarse grain range even to a higher degree. The causes are: coarse-grained structure, singling out of brittle excess ferrite along the boundaries of overheated grains, and the presence of sulfide inclusions in the ferrite edges along the grain boundaries. The negative effect of sulfur upon the toughness of 20G3 steel in the weld joints increases strongly with a higher carbon content in the steel. The possibility was established of melting low alloy 20G3 steel without a decrease in toughness in the superheated zone during electric slag melting. The basic conditions for producing such a steel are: melting with not over 0.02% S, deoxidation with 0.02 - 0.04% rated amount of free Al. It is recommended to use ferroaluminum for deoxidation taking into account Al losses during its introduction into the ladle. The P content should be limited to 0.02%. The thermal cycle of the electric slag welding process was determined by S. S. Astaf'yev,

Card 2/3

The effect of the steel melting method upon...

S/135/63/000/001/001/016  
A006/A101

A. I. Rymkevich, (TsNIITMASH), A. I. Pugin and V. A. Merkulov (IMET imeni Baykov). There are 10 figures and 2 tables.

ASSOCIATION: TsNIITMASH

Card 3/3

L 12894-63

BDS/ENP(q)/EWT(m)

AFFTC/ASD

JD/HM

ACCESSION NR: AP3000678

S/0096/63/000/006/0010/0015

61  
59

AUTHOR: Kryanin, I. R. (Doctor of technical sciences, Professor); Mirkin, I. L. (Doctor of technical sciences, Professor); Trusov, L. P. (Candidate of technical sciences)

TITLE: Steel used in stationary steam power plants operating at high ultra-high pressures and temperatures

SOURCE: Teploenergetika, no. 6, 1963, 10-15

TOPIC TAGS: power plant, steam pipe, welding, steel type, 12Kh1MF steel, 15Kh1MF steel, EI-756 steel

ABSTRACT: A study of characteristics and manufacture of steels 12Kh1MF, 15Kh1MF, and EI-756 (12Kh11V2MF) for use in 200-, 300-, 500-, and 800-Mwt power plants operating at 170 abs. atm. and 570C or at 255 abs. atm. and 585C was made at Tsentral'nyy nauchno-issledovatel'skiy institut tekhnologii i mashinostroyeniya (Central Scientific Research Institute of Technology and Machinery). The limit of strength in forged and perforated pipes of steel 15Kh1MF, with a wall thickness of 45-85 mm was found to be 9-10 kg/Sq mm at 585C. It was 8-9 kg/Sq mm for welded pipe joints. The test of original and welded parts indicated a high plasticity.

Cord 1/82

L 12894-63

ACCESSION NR: AF3000678

2

This perlite steel is recommended for production of steam pipes in 300-Mwt plants operating at 585C and 255 abs. atm. Table 1 (see enclosure) shows allowable and ultimate stresses for both steels at a temperature range of 520-600C. Electrode Tsl-34 is recommended for welding this material with a preheating temperature of 300-350C. The use of thick pipes made of steel 12Kh1MF for the same power plants is not recommended because of the low limit of sustained strength in this steel. Experiments on pipes of chromium-molybdenum-vanadium steel with additional ingredients will be finished in 1963. Martensite-ferrite steel EI-756 and electrodes Tsl-32 are recommended for pipes in power plants operating at 585-630C. Bisectonal induction coils of both rigid and flexible types are recommended for local heating in welding straight and curved pipes. Orig. art. has: 7 figures and 4 tables.

ASSOCIATION: TsNIITMASH

SUBMITTED: 00

DATE ACQ: 21Jun63

ENCL: 01

SUB CODE: 00

NO REF SOV: 003

OTHER: 000

Card 2/32



KRYANIN, I.R., doktor tekhn.nauk, prof., red.; OSIPOVA, L.A., red.izd-va;  
SMIRNOVA, G.V., tekhn.red.

[Improving the quality of G13L steel castings] Povyshenie kachestva  
otlivok iz stali G13L. 202 p. (Moscow. Tsentral'nyi nauchno-  
issledovatel'skii institut tekhnologii i mashinostroeniia.  
[Trudy], vol. 106).

(Steel castings)

(MIRA 16:8)

POKATAYEV, S.V., inzh.; NOVITSKIY, V.K., kand. tekhn. nauk; KRYANIN, I.R.,  
doktor tekhn. nauk

Effect of steelmaking conditions on the impact toughness at  
low temperatures of electric slag welded joints. Svar. proizv.  
no.6:22-26 Je '63. (MIRA 16:12)

1. TSentral'nyy nauchno-issledovatel'skiy institut tekhnologii  
i mashinostroyeniya.

heat-resistant steels for heat power engineering

M. M. Kuznetsov, No. 12, 1954, 2-5

STEEL AGS: steam power plant, forging, turbine rotor, chromium, molybdenum, vanadium, R2 steel, R21 steel, 21756 high speed steel, 2120 steel, 2120 steel

39  
34  
8

Summary of the recommendations for promising types of steel to be used in steam power plant, is presented. For coarse forgings for rotors with disk diameters up to 1100 mm, chrome-molybdenum-vanadium steels of the types R-2, R-21, and 21-15 are recommended. For turbine castings, steels of the types 21-20, 21-201, and 21-291 are recommended. These steels satisfy very well the requirements of high durability

APPROVED FOR RELEASE: 06/14/2000

with good corrosion resistance. The stress-corrosion cracking of these

materials is not a problem at 200°C and 100% relative humidity. The

materials are recommended for use in the design of aircraft engine

components.

The following table gives the mechanical properties of these

materials at 200°C and 100% relative humidity.

The materials are also available in the form of sheet, plate, and

rod.

The materials are also available in the form of castings.

The materials are also available in the form of forgings.

The materials are also available in the form of extrusions.

The materials are also available in the form of welds.

The materials are also available in the form of rivets.

The materials are also available in the form of bolts.

The materials are also available in the form of nuts.

The materials are also available in the form of washers.

The materials are also available in the form of gaskets.

The materials are also available in the form of seals.

The materials are also available in the form of valves.

The materials are also available in the form of nozzles.

The materials are also available in the form of manifolds.

The materials are also available in the form of ducts.

The materials are also available in the form of pipes.

The materials are also available in the form of tanks.

The materials are also available in the form of vessels.

The materials are also available in the form of containers.

The materials are also available in the form of drums.

The materials are also available in the form of cylinders.

The materials are also available in the form of spheres.

The materials are also available in the form of cones.

The materials are also available in the form of pyramids.

The materials are also available in the form of prisms.

The materials are also available in the form of cubes.

The materials are also available in the form of spheres.

The materials are also available in the form of cylinders.

The materials are also available in the form of cones.

The materials are also available in the form of pyramids.

The materials are also available in the form of prisms.

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The materials are also available in the form of spheres.

The materials are also available in the form of cylinders.

The materials are also available in the form of cones.

The materials are also available in the form of pyramids.

The materials are also available in the form of prisms.

L 01926-57 EWT(m)/I/EWP(w)/EWP(t)/ETI- IJP(c) WB/JD

ACC NR: AR6031846

SOURCE CODE: UR/0285/66/000/006/0023/0023

AUTHOR: Kryanin, I. R.

TITLE: Studies in the resistance to cavitation<sup>A</sup> and abrasion-corrosion of materials used in the construction of hydroturbines

SOURCE: Ref. zh. Turbostroyeniye, Abs. 6.49.127

REF SOURCE: Sb. Kavitats. i gidroabrazivn. stoykost' met. v gidro-turbinakh. M., Mashinostroyeniye, 1965, 3-9

TOPIC TAGS: cavitation, corrosion resistance, turbine, hydraulic turbine, cavitation resistance, abrasion, abrasion resistance, metal casting

ABSTRACT: An enumeration is made of the studies conducted by the Central Scientific Research Institute of Machine Technology (TsNIITMASH) in conjunction with the Leningrad Metals Plant (LMZ), the Khar'kov Turbine Plant imeni S. M. Kirov (KhTbZ), and the Nevskiy, Novo-Kramatorskiy, and Elektrostal' machine-building plants on materials, casting and surfacing techniques, and the mechanism of failure

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UDC: 621.224.001.5

L 01926-67

ACC NR: AR6031846

from cavitation, <sup>16</sup>abrasion, and <sup>1</sup>corrosion, both under laboratory con-  
ditions and at hydroelectric power stations. [Translation of abstract]  
[SP]

SUB CODE: 11

hs

Card 2/2

PAVLENKO, G.; ARSHAVSKIY, A., sovetnik yustitsii; KATANER, G.;  
TSIPERFIN, I., inzh.; KRYANNIKOV, A., shofer; ZHALNIN, A.

Readers' letters. Avt. transp. 41 no.6:57-58 Je '63,  
(MIRA 16:8)

1. Starshiy inzh. Ministerstva avtomobil'nogo transporta  
Kirgizskoy SSR (for Kataner). 2. Oktyabr'skoye avtokhozyaystvo  
Volgogradskogo avtouppravleniya (for Kryannikov).

KRYANOVA, L.

USSR (600)

Ice Cream, Ices, Etc.

Soft ice cream. (Résumé from English by L. Krysanova.) Mol. prom No. 7, 1952

9. Monthly List of Russian Accessions, Library of Congress, October 1954, Uncl.  
2



KRYAT, P.I.

Machinery developed by the Ukrainian Research Institute of Agricultural Machinery and Equipment. Trakt.1 sel'khoz mash. no.8:  
25-27 Ag '59. (MIRA 12:11)

1. Direktor Ukrainskogo nauchno-issledovatel'skogo instituta sel'sko-khozyaystvennogo mashinostroyeniya (UkrNIISKhOM).  
(Ukraine--Agricultural machinery)

KRYAT, P.I., inzh., IVANCHENKO, I.P., inzh.

Developing agricultural machinery for sugar beet growing. Trakt.  
i sel'khoz mash. 30 no.8:22-24 Ag '60. (MIRA 13:8)

1. Ukrainskiy nauchno-issledovatel'skiy institut sel'skokhozyayst-  
vennogo mashinostroyeniya.  
(Agricultural machinery) (Sugar beets)

Excerpta Medica 1/2 sec 17 Feb 55 Pub. Health, Social Medicine & etc

846. KRYATCHKO I. A. \*Physical culture and disease prevention  
(Russian text) SOVETSK. ZDRAVOOKH. 1954, 2 (16-21)

BOBRIYEVICH, A.P.; KRYATOV, B.M.; SHCHUKIN, V.N.

Some data on the geology and petrography of Siberian kimberlites.  
Trudy IAFAN SSSR. Ser.geol. no.6:24-36 '61. (MIRA 14:9)  
(Daldyn Valley--Kimberlite)

SHCHUKIN, V.N.; KRYATOV, B.M.; VOLOTOVSKIY, A.G.

Relationship between kimberlites and traps. Trudy IAFAN SSSR.  
Ser.geol. no.6:45-48 '61. (MIRA 14:9)  
(Siberian Platform--Kimberlite)  
(Siberian Platform--Rocks, Igneous)

ACC NR: AP6022194

SOURCE CODE: UR/C026/66/000/006/0100/0105

AUTHOR: Kryatov, B. M.

ORG: none

TITLE: Diamonds<sup>6</sup> of Yakutiya

SOURCE: Priroda, <sup>27</sup>no. 6, 1966, 100-105

TOPIC TAGS: diamond, petroleum, gas, mining

ABSTRACT: The author reviews the history of diamond mining and the recent expansion of mining sites in Yakutiya. He describes kimberlite pipe formations and their geographic distribution, enumerates the various mineral inclusions in kimberlite rock, and relates the supposed origin of their shape. Various theories on the origin and formation of diamonds are discussed. There are indications that diamonds can be produced by a shock wave during an explosion. It is supposed that hydrogen and acetylene gas can accumulate in the magnetic chamber and replace decaying methane and other hydrocarbons. Oxygen can penetrate from sedimentary rock as a result of decomposition of water and other hydrocarbons. Considerable amounts of CO and CO<sub>2</sub> will penetrate into the juvenile gas. This hypothesis makes

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UDC: 533.81

422-  
ACC NR: AP6022194

it possible to envisage a relation between richer kimberlite pipes and the magnetic chambers of kimberlite magma situated inside or close to petroleum gas formation. It is known that original diamond deposits are in fact situated in areas close to petroleum and gas-bearing formations. Orig. art. has: 4 figures. [GC]

SUB CODE: 08, 11/ SUBM DATE: none

Card 2/2 MT

KRYATOV, B.M.

Contact changes in kimberlites and enclosing rocks of the  
"Zarnitsa" pipe. Trudy IAPAN SSSR. Ser.geol. no.6:64-66  
'61. (MIRA 14:9)  
(Daldyn Valley--Kimberlite)



L 23023-66 ENT (m)/ENF(j) NW/RM

ACC NR: AP6009565

SOURCE CODE: UR/0236/65/000/003/0095/0101

AUTHOR: Dolgopol'skiy, I. M. -- Dolgopolskis, J.; Vayshtarene, K. V. -- Vaistariene, K.; Kryauchynas, I. I. -- Kriauciunas, J. 29

ORG: Institute of Chemistry and Chemical Engineering, Academy of Sciences, Lithuanian SSR (Institut khimii i khimicheskoy tekhnologii Akademii nauk Litovskoy SSR) B

TITLE: Synthesis of vinyl fluoride using a suspended catalyst

SOURCE: AN LitSSR. Trudy. Seriya B. Fiziko-matematicheskkiye, khimicheskkiye, geologicheskkiye i tekhnicheskkiye nauki, no. 3, 1965, 95-101

TOPIC TAGS: vinyl fluoride, acetylene, hydrogen fluoride

ABSTRACT: The reaction of hydrofluorination of acetylene in the presence of a suspended catalyst (suspension of mercuric oxide in vaseline oil) was investigated because the same reaction on a solid catalyst has many disadvantages. It was found possible to carry out a continuous and regular feeding of hydrogen fluoride by isothermally evaporating its mixture with acetylene; one liter of acetylene at 0°C carries off 2.98 g of hydrogen fluoride, i. e., the acetylene/HF ratio is 1:3.48. The conditions of vinyl fluoride synthesis were determined: the degree of conversion of acetylene and the reproducibility of the yield per unit weight of the catalyst reach their maximum at 50°C, at a 15% HgO concentration, and an acetylene feed rate of 6 l/hr. The

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L 23828-66

ACC NR: AP6009565

consumption of acetylene on the formation of 1,1-difluorethane, a by-product of the reaction, was found to decrease as the temperature rose from 30° to 70°C. This is due to a decrease in the solubility of the reacting components, i. e., vinyl fluoride and hydrogen fluoride and also acetylene, in the liquid phase of the catalytic mixture. Orig. art. has: 5 tables.

SUB CODE: 07/

SUBM DATE: 20Feb65/

ORIG REF: 004/

OTH REF: 007

Card 2/2 *fv*

VAYCHAIKIN, K.V. [Vaisharlene, K.]; KRYACHUNAS, I.I. [Kriacunas, J.]

Separation of a gaseous mixture consisting of acetylene, vinyl  
fluoride, and 1,1-difluoroethane. Trudy AN Lit.SSR. Ser. B no.3:  
103-108 '65. (MIRA 19:1)

I. Institut khimii i khimicheskoy tekhnologii AN Litovskoy SSR.  
Submitted January 15, 1965.

ИЗДАТЕЛЬСТВО, Л. М. [Издательство, Л. М.]; ИЗДАТЕЛЬСТВО, Л. М. [Издательство, Л. М.];  
ИЗДАТЕЛЬСТВО, Л. М. [Издательство, Л. М.]

Synthesis of vinyl fluoride using a complexed catalyst. Trudy AN  
lit. SSR. Ser. B no.3:95-101 '65. (MIRA 19:1)

1. Institut khimii i khimicheskoy tekhnologii AN SSSR, Moscow 103.  
Submitted February 20, 1965.